

M/053/005

# Tenneco Minerals

A Tenneco Company

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DOGM  
MINERALS PROGRAM  
FILE COPY

March 13, 1989

Mr. Lowell P. Braxton, Administrator  
Utah Department of Natural Resources  
Division of Oil, Gas, and Mining  
355 W. North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203

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DIVISION OF  
OIL, GAS & MINING

Dear Mr. Braxton:

Enclosed please find Tenneco Minerals estimate as to anticipated decommissioning costs at the Goldstrike Mine. At this time, Tenneco Minerals does not know to what extent the ore heaps will have to be neutralized. The Utah bureau of Water Pollution Control is in process of developing heap decommissioning standards that Tenneco Minerals will adopt once the UBWPC committee approves the standards.

Also, you should be aware Tenneco Minerals' facilities were not approved to operate until February 23, 1989. It is within this period of time Tenneco assumed that it had to respond to the Division regarding bond adjustment.

Please advise us as to any discrepancy or concerns you may have.

Sincerely,

Ken A. Kluksdahl  
Mine Manager

KAK:sl

Enclosure



## I. HEAP DECOMMISSIONING

Tenneco Minerals was granted a permit to construct heap leach facilities on November 3, 1988 and a permit to operate on February 23, 1989. These permits were issued within the following understanding for neutralization:

"The neutralization criteria shall be as adopted by the Utah Water Pollution Control Committee at the time of decommissioning, or as approved in writing by the Bureau at the time of decommissioning, but in no case shall the neutralization criteria for this heap leach project result in degradation of the surface or groundwater quality including beneficial use thereof in the vicinity."

This was done to facilitate construction at the site as well as allow the Utah Bureau of Water Pollution Control to develop standards for neutralization which adequately address total cyanide, weak acid dissociable (WAD) cyanide, metals levels, and pH in rinseate.

Based on these considerations, Tenneco Minerals has developed cost data which would allow for the following to occur (within the heap):

- 1) Total and (WAD) cyanide levels of <5 ppm
- 2) Metals levels not to exceed background levels
- 3) pH levels which would most likely be 9-10.5

## II. CALCULATION:

Current mine reserve data suggests 4.5 million tons of ore will ultimately be required to leach with cyanide solution. At the project end, we estimate 2.1 million tons of ore will be required to be neutralized. (This process would begin as leach operations discontinue over specific pads during mine operations). Further, assume the ore has been rinsed with water to where residual cyanide is 12 ppm.

Exxon Chemicals DiClor reagent or a similar product with water would be used to neutralize to the decommission standard. Therefore,  $12 - 4 = 8\text{ppm}$  to reduce.

Twelve parts of DiClor are required to destroy one part of cyanide. Therefore:

$2,000/\text{ton ore} \times 10\% \text{ water (amount to saturate)} =$   
200 lb of water to saturate one ton of ore

$200 \text{ lb water} \times 8 \text{ ppm cyanide} = .0016 \text{ lb cyanide/ton of ore}$



.0016 lbs cyanide/ton ore x  $\frac{12 \text{ DiClor}}{1 \text{ cyanide}}$  = .019 DiClor/ton ore

Cost @ \$8/gal ÷ 10.5 lb.gal = \$.77/lb

Cost/ton of ore = \$.77/lb x .019 lb/ton = \$.015/ton

Cost/ton of ore x 2.1 mm tons = \$31,500

At 700 GPM pumping rate:

Total water demand = 200 lb water/ton ore x 2.1 mm tons  
= 430 mm lbs = 50.4 mm gal  
@ 420,000 gal/day = 120 days pumping

Pumping costs are estimated at \$2,200/month based upon a 30 day month.

\$3,200/month x 4 months = \$8,800

Labor is Tenneco Minerals.

TOTAL ESTIMATE = \$40,300